NATURAL HISTORY MUSEUM

DinoJaws

Chew Chomp Munch Crunch

Information pack

Maren Krumdieck
Marketing & Sales Manager
Touring Exhibitions
The Natural History Museum
Cromwell Road
London
SW7 5BD

Telephone: +44 (0) 20 7942 6245
Facsimile: +44 (0) 20 7942 5686
Email: m.krumdieck@nhm.ac.uk

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Exhibition overview

What did dinosaurs eat – and how do we know? Featuring the most frighteningly life-like moving dinosaurs ever created, this family blockbuster exhibition explores the sometimes gruesome, and often disgusting, subject of dinosaurs and their food.

From the infamous flesh-eating *T. rex* to the plant-munching *Iguanodon*, different dinosaurs ate different foods and often had unique ways of gathering (or catching) their dinner. This spectacular exhibition includes intriguing fossil evidence, fun hands-on exhibits, fascinating scientific insights and spectacular animatronic models – revealing everything scientists now know about what and how dinosaurs ate.

Visitors can dig for virtual fossil evidence to discover what *Baryonyx* ate and plunge their hands into a huge poo to find traces of what *Euoplocephalus* munched on.

Target audience

The exhibition is aimed at school groups and families with children aged seven and older with some activities aimed at children aged four to six.

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Aim of the exhibition

Through this project learners will...

- develop and use skills to locate and interpret scientific evidence so they can determine what and how dinosaurs ate
- understand different feeding mechanisms used by dinosaurs to eat their food
- engage in dialogue about dinosaur feeding strategies and the work of Museum scientists on this subject
- be inspired to discover more about dinosaurs and the study of them
- enjoy engaging with the exhibits and the animatronics

Through the digital trail, visitors will...

- enjoy solving a mystery relating to dinosaurs and their feeding strategies
- use observational and listening skills to unravel clues about what their dinosaur ate
- look in more detail at the feeding mechanisms used by a particular dinosaur
- have a more personalised experience in the exhibition
- engage in conversation with their family or school companions about their individual dinosaur mystery
- be inspired to use the website for more about dinosaurs and the study of them

Values, attitudes and beliefs

Visitors will:

- be shocked at the knowledge that some dinosaurs may have been cannibals
- surprised at the knowledge that not all 'big' dinosaurs were carnivorous

Creativity, inspiration and enjoyment

Visitors will:

- enjoy the impact of a large number of animatronics

Skills

Visitors will:

- compare the feeding strategies of the four groups of animatronics
- share observations of the animatronic species and their environment
- make a link between the activities in the lab area and the *Baryonyx* scene
- use their newly acquired skills and knowledge to work out which is their mystery dinosaur

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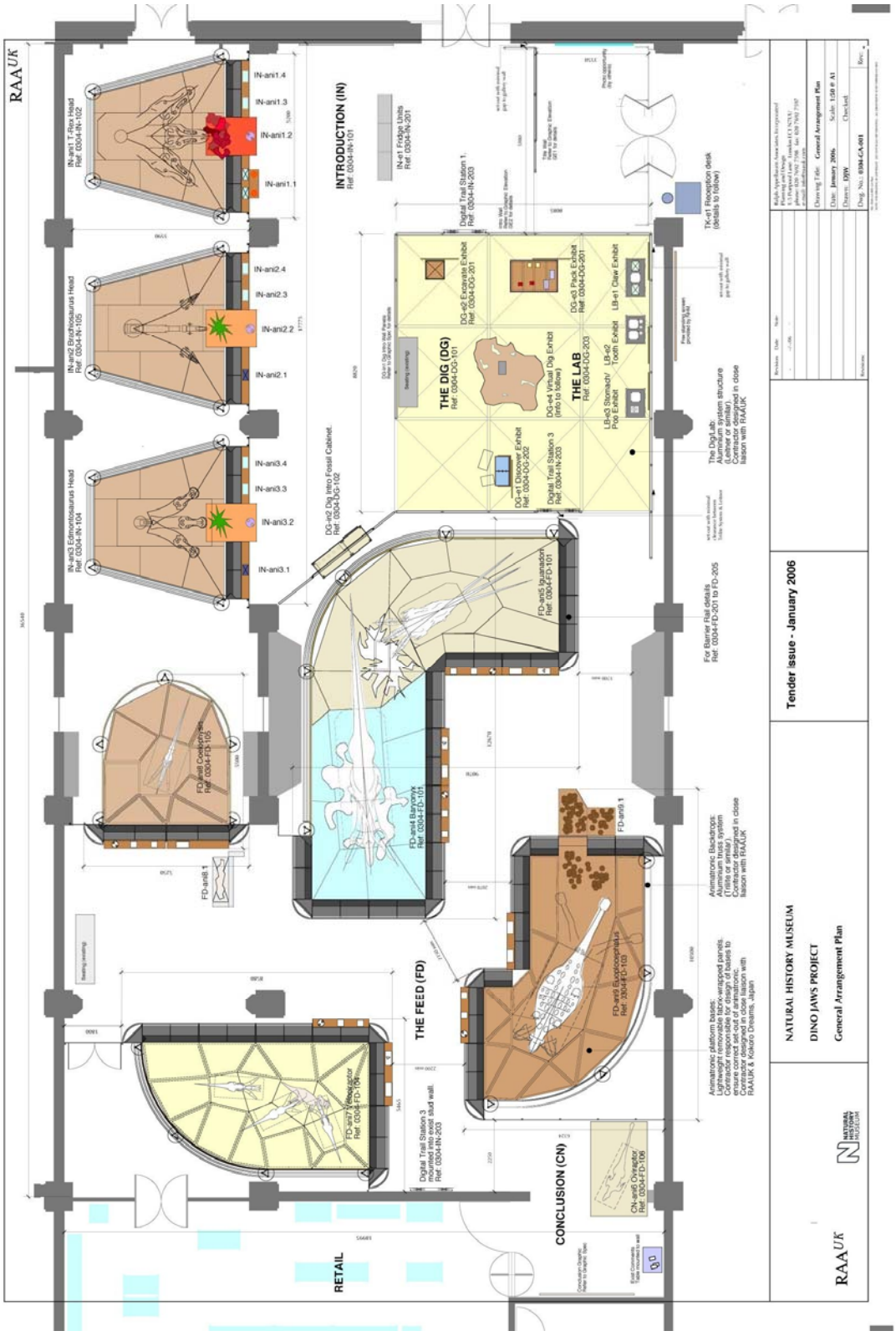
Gallery plan



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Scenes and storyline

The exhibition is divided into three areas:
The introduction area, the dinosaur dig and the feeding frenzy. Linking these areas together is the digital trail.

The digital trail lets visitors discover the identity of their own mystery dinosaur.

Visitors have to swipe a barcoded ticket at interactive stations throughout the exhibition to get diet-related clues about their mystery dinosaur, revealed at the end of the exhibition.
At the first station, visitors meet a young palaeontologist and her friend Richard. These two introduce visitors to the challenge of the trail and tell them how important their tickets are. Visitors receive their first clue, which relates to their mystery dinosaur's diet.
Are you able to put all clues together and guess your mystery dinosaur?

For venues that want to drive visitors back to their website after their visit, there is a possibility of linking the *Dino Jaws* digital trail to the host venue's website for visitors to printout certificates and to play more games.

The ***introduction area*** is dominated by three life-sized animatronic dinosaur heads, which demonstrate basic anatomical differences between meat-eaters and plant-eaters. Visitors can also explore different kinds of teeth and biting mechanisms.

Three fridges in the introduction area allow visitors to think about what dinosaurs might have eaten, comparing it with some of the food in their kitchens at home.

Three life sized animatronic dinosaur heads including the terrifying *T. rex* show how the teeth and jaws move together to tear, grind and chew food. One half of each head is fleshed and the other half is bone. This enables visitors to get a close up look at the grinding jaws.

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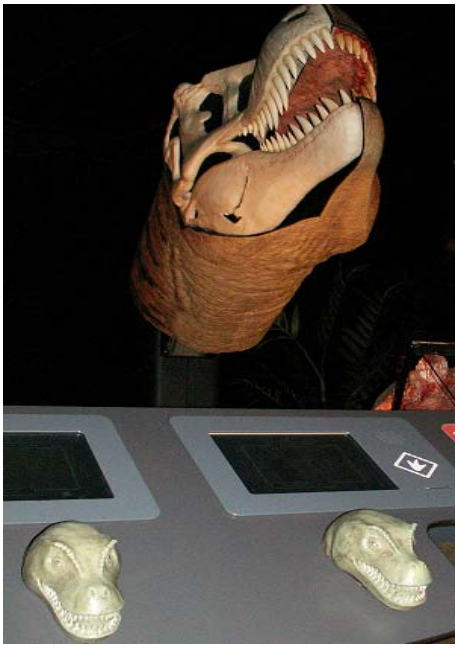
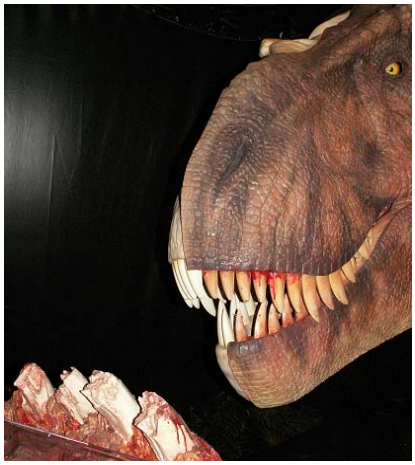
This *T. rex* bite force interactive gives visitors a chance to measure their strength against the unbelievable power of the *T. rex* bite.





The in famous *T. rex* was of course a carnivore. This popular dinosaur moves in a dramatic way making bone-crunching noises. None of the visitors will have a problem imagining the way it used to tear its prey apart.

The *Brachiosaurus* is an herbivore, but its teeth were not very good for grinding plants. Its stomach, however, contained stones (gastroliths) that did the grinding work .

The *Brachiosaurus* stomach stone interactive allows visitors to feel a stomach with the gastroliths inside.

The *Edmontosaurus* was a herbivore with spare teeth in its jaws and a unique jaw mechanism to grind its food.

Visitors can see its jaws in motion in a simple *Edmontosaurus* jaw interactive, which demonstrates this unusual feature.

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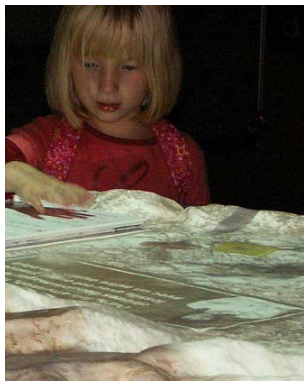
The **dinosaur dig** area is a virtual dig experience. Visitors turn into dinosaur detectives to find key fossil evidence of dinosaur diets. This area is based on the discovery of *Baryonyx* – a giant fish-eating dinosaur, unearthed just outside London. The dinosaur lab is set within the same space, a fully equipped field laboratory area for visitors to explore fossils in more depth.



The major attraction in this area is the interactive projection dig table. Visitors unearth their own fossils using specialist tools. They can uncover teeth, jaws or claws buried beneath the hard ground.
Further associated exhibits show some of the work tools used by palaeontologists when digging for dinosaurs.

Next to the projection table are several activities for pre-school children. Four to six year olds can flick through the pages of a giant book for the amazing story of how *Baryonyx* was discovered.

In addition, they can pack up a fossil ready for transport.

...and practice fine-detailed excavation work.

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The lab: Visitors can investigate the fossils that were unearthed to discover more about the feeding behaviour of *Baryonyx*.

At the teeth investigation station, visitors compare *Baryonyx* teeth to those of other dinosaurs and living reptiles to get clues as to what it might have eaten.

At the claw investigation station, they piece together a *Baryonyx* claw and consult with palaeontologists to find out how it used to catch food.

At the final investigation station, the young scientists study sections of fossilised stomach contents and poo under the microscope to find evidence of dinosaur food.

The dig and lab area aims to show visitors how we know what we do about basic dinosaur biology.

Stepping back in time, visitors find themsleves walking into the **feeding frenzy** of hungry dinosaurs. Seven full-bodied, life-sized animatronic dinosaurs in dramatic scenes demonstrate some of the different dinosaur feeding strategies, from slow-moving plant-eaters to fierce, agile flesh-eaters. Visitors are encouraged to investigate these dinosaurs, asking questions and piecing together fossil and other evidence.

Visitors witness a pack of *Velociraptor* devouring the carcass of a *Protoceratops*. In this living animatronic scene, they see the full force of the feathered *Velociraptor*, with their grasping hands, climbing claws and teeth for ripping flesh.

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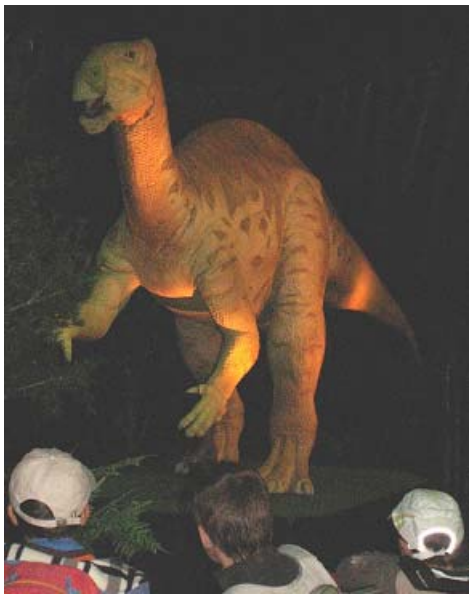
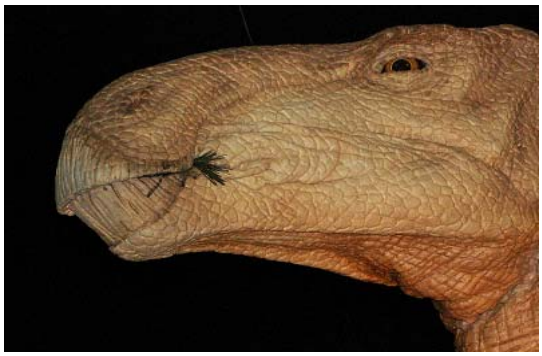


The plant-eating *Iguanodon*



The life-sized *Baryonyx* animatronic is 8.5m long and was a fish-eater. Visitors can see its claw in action, as it tries to scoop a fish from the water.

Visitors learn more about the dinosaur feeding behaviour with the help of more mechanical interactives.

Turn the wheel or use the sliders to access more information. How much food would these animals eat compared with modern day food? About 15kg of carrots or 1kg of chicken every day?
A replica of a *Baryonyx* claw provides a hands-on experience for visitors.

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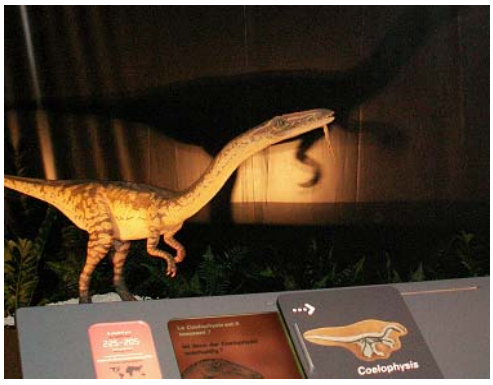
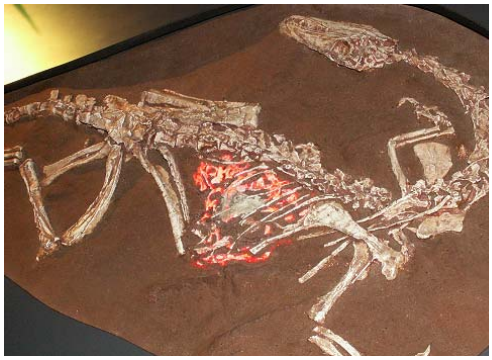
Piled high behind the plant eating *Euoplocephalus* animatronic is a giant pile of poo. Visitors can investigate the poo to find traces of what this armoured dinosaur might have eaten. They can also touch real fossilised dinosaur poo. However, they have to watch out for the deadly swinging tail of the *Euoplocephalus*.



By touching the stomach of this *Coelophysys* fossil its content is highlighted and you can see the crocodile remains.

Until recently scientists thought that the deadly *Coelophysys* ate the young of its own species. Very recent research however published only in 2006 shows that remains in its stomach were young crocodiles. The *Coelophysys* wasn't a cannibal after all.



After having learned so much about dinosaur feeding behaviour and their claws and teeth, visitors are confronted by an animated *Oviraptor*. Palaeontologists are still trying to understand its strange combination of feeding characteristics. Could it have been a plant or flesh eater?
You decide...

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Specifications

The Natural History Museum's responsibilities

* seven impressive life-sized animatronic dinosaur models
* three life-sized animatronic interactive dinosaur heads with integral barrier system and interactives
* interactive virtual dino dig projection table
* real specimens
* hands-on replicas
* mechanical and screen-based interactives
* exhibition graphics and text for translation and production of text panels
* promotional images
* educational events suggestions
* installation and dismantling service of animatronic models
* technical support services
* instructions for day-to-day supervision

Host venue's responsibilities

* an indoor display area of minimum 650m^2
* temperature-controlled environment between 18°C – 25°C
* minimum doorway access: height 2.3m and width 1.8m
* transport costs from previous venue in 6 x 13.5m tilt trailers
* air compressor and pipework to power the animatronic models
* translation and production of text, text panels and graphics
* skilled support staff to assist with installation and dismantling
* forklift, crane, hoist and other equipment required for access
* two scaffold towers for installation and dismantling
* promotion and publicity
* production of bar coded tickets (according to our specifications) for the digital trail
* optional: provision of additional groundwork around models
* transit and exhibition insurance public liability insurance

Average installation/dismantling period

* 14 days

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Press release

Press release
9 June 2006

Meet the hungry dinosaurs

Dino Jaws
30 June 2006 – 15 April 2007
Media preview: 29 June 2006

What did dinosaurs eat – and how do we know? Find out this summer at the Natural History Museum's new family blockbuster exhibition, introducing you to the fascinating, and sometimes disgusting, subject of dinosaurs and their food.

Bringing together intriguing fossil evidence, fun hands-on exhibits, scientific insights and the 10 most lifelike and spectacular animatronics you have ever seen, it will reveal everything scientists now know about what and how dinosaurs ate.

'Everyone knows that *T. rex* was a meat-eater, but can you tell what *Baryonyx* ate for dinner?' said Dr Angela Milner, dinosaur expert at the Natural History Museum. 'You'll become a dino-detective and study dinosaur jaws, claws, guts and even poo, to discover what dinosaurs ate, using the same techniques that scientists use.'

Visitors will find themselves stepping millions of years back in time into a world populated by hungry dinosaurs. From slow-moving plant-eaters to fierce, agile flesh-eaters, these dinosaurs will demonstrate a variety of feeding strategies. Visitors will come face-to-face with the plant-eating *Iguanodon* and *Euoplocephalus* and the awesome *Baryonyx* as it tries to scoop a fish from the water. A large scene contains a pack of *Velociraptor* devouring the carcass of a *Protoceratops* with their grasping hands, climbing claws and teeth for ripping flesh.

Dino Jaws also includes several inventive and fun interactive exhibits. A favourite is likely to be a huge steaming, stinking mound representing several week's worth of *Euoplocephalus* poo, which visitors can touch and examine to discover what this massive plant-eater ate. They can also touch a real fossilised dinosaur poo, known as a coprolite.

As they become dino-scientists, visitors will tackle a virtual dig to unearth fossilised teeth, claws or stomach contents using specialist tools, and then identify them. The virtual dig will be based on the discovery of *Baryonyx* – a giant fish-eating dinosaur – unearthed just outside London and excavated by a team including Natural History Museum scientists.

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Visitors will swipe a barcode on their tickets at points throughout the exhibition to get diet-related clues to the identity of a mystery dinosaur. They can then access this information after their visit and continue their investigations at home.

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Visitor evaluation summary – January 2007

Introduction

Dino Jaws was a temporary, touring exhibition at the Natural History Museum.
It consists of animatronic dinosaurs, a digital trail and other activities and is aimed at families with children aged five to 11.
Evaluation was carried out over summer and autumn 2006 during school holidays, weekends and term time weekdays. A variety of methods were used to gather data: visitor tracking, an exit survey, open-ended interviews with schoolchildren and pop up web surveys.

Visitor profile

In the period July–November 2006, *Dino Jaws* attracted 158,807 visitors, an average of 1,134 per day. Nearly double the number of visitors attended during weekend and holiday times as compared with term time weekdays.

In terms of the age profile of those surveyed and tracked, the exhibition did seem to be primarily attracting its core target audience of families with children aged five to 11.

Visitor views about *Dino Jaws* – what did they say?

Visitors were interviewed as they were leaving *Dino Jaws*. Also, three schools were visited and their students interviewed several weeks after their visit. The survey and interviews aimed to find out what visitors felt about the exhibition and to find evidence of learning.

The most popular part of the exhibition was the large animatronic dinosaurs. The interactive components also scored highly with visitors. In particular, the virtual dig and digital trail were popular. These elements were also popular with schoolchildren.

Conclusions

From observing and interviewing schools and family visitors it is clear the exhibition provides an enjoyable and affective experience for the vast majority of visitors. It is engaging and sparks conversation among group members, highlighting the potential for learning in the exhibition. The carnivores animatronics and virtual dig were particularly engaging.

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Media coverage: examples

INTERNATIONAL PRESS-CUTTING BUREAU
224/236 Walworth Road, London SE17 1JE
Tel: 020-7708 2113 Fax: 020-7701 4489
e-mail: IPCB2000@aol.com

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TIME OUT

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28 JUN 2006

Something to get your teeth into *The Natural History Museum's exhibition reveals what dinosaurs ate – and how we know*

All-consuming interest

As a new exhibition looking at the diets of dinosaurs opens at the Natural History Museum, Peter Watts ponders why kids find them so enduringly fascinating

Why are kids so fascinated with dinosaurs? It's a question that the experts at the Natural History Museum have spent some time considering, given that this particular obsession accounts for a large proportion of the museum's attendance. Dr Paul Barrett, a palaeontologist who has been working on the museum's new 'Dino Jaws' exhibition and once gave a guided tour to a bunch of young Arsenal fans and the clubs Gunner-saurus mascot, is in a good position to explain – he's been a dinosaur fan since he read the 'Ladybird Book Of Dinosaurs' when he was six.

'I had a little wobble when I was nine and wanted to be a vet, but I came back to it strongly after that,' says Barrett with understatement; his office must rival the museum shop when it comes to dinosaur paraphernalia. 'But that's quite unusual. Most professionals tend to come to dinosaurs quite late – of my close colleagues in the UK, only a few of us were certified dino-nuts at a young age, most picked it up after university. So dinosaur-workers tend to have a much less romanticised view of the subject, because they haven't been in with it since they were crawling – they approached it more objectively.'

Psychologists have traditionally explained the children-dinosaur crossover as 'big, scary, extinct', or as Barrett succinctly puts it: 'dinosaurs are big and scary, but they're dead and safe, so it's a way of managing fear'. However, in 2005 Creative Partnerships – an Arts Council-funded project that tries to animate the National Curriculum – conducted a study with Churchfield School, Edmonton and came to a different conclusion. It found that children liked dinosaurs that were seen as friendly as much as those seen as fierce, and that the fascination is more to do with the diversity and range of dino-types than anything else. The report states: 'Throughout the work with children there was no suggestion at all of conscious or subconscious safety through knowledge of dinosaurs being extinct. The children discussed dinosaurs as if they were still alive. Children's fascination and imaginative interest in dinosaurs appeared to display little difference from an interest in potentially "scary" living animals, such as sharks and tigers.'

So much for 'big, scary, extinct'. According to Barrett, there may be a third explanation: 'Some psychologists suggest it's a way that kids can control their parents. Kids soak up all the dino-facts and are comfortable coming out with all these long, complicated Latin names like pachycephalosaurus, while their parents are hopeless at it. This is a way children establish superiority over their parents because they can easily trip these things off their tongues while their parents are completely flummoxed.'

Barrett (who, endearingly, has christened one dinosaur himself and admits deliberately giving it a complicated name to confuse his peers) sees this in action whenever he gives talks at the museum. 'You get kids who know an awful lot. All the names and where all the dinosaurs come from. They tend to know a lot more than the adults, so when you do a public talk you get the more interesting questions from the kids. The adults will ask something that's actually quite obvious, where-

'Kids like coming out with complicated Latin names like pachycephalosaurus, while their parents are hopeless at it. It's a way children establish superiority over their parents'

as the kids will ask quite technical questions because they'll have read around a lot more. But they can also be very dogmatic. If their favourite book says something, no matter how hard you try to convince them otherwise, they won't be moved.'

It's the Natural History Museum's job to try to tap this interest every few years in the form of new and interesting exhibitions. After the success of the T-Rex animatronics, its new exhibition, 'Dino Jaws', goes big on moving models, using ten animatronic dinosaurs to illustrate what dinosaurs ate and how they ate it.

'We're showing a lot of cutting-edge research,' says Barret. 'There have been developments using techniques from engineering to look at dinosaurs as eating machines, and you can do quite complex analysis using computer models to see how the skull and jaw would move. That's stuff that's never been shown to the public. It's also a way of looking at lots of different sorts of dinosaurs in one go. We've got plant-eaters and meat-eaters, some quite bizarre that aren't looked at normally.'

The exhibition also encompasses a dino-dig in front of the museum, where budding fossil-hunters can trawl for bone casts in a bid to get even younger children interested – the exhibition's starting age is four, rather than the usual seven. But that doesn't mean it will be dumbed down.

'You can't patronise children,' says Barrett. 'They're a very discerning audience with good background knowledge. So there's lots of information. But even the most dedicated dino-nut will still get pleasure out of simply seeing the things, the skeletons and the animatronic models. We'll be showing in a lot of nice detail how dinosaurs lived. People get caught up in the extinction, but we're showing them as living animals rather than creatures that were around for a bit before getting squashed by a meteorite.'

'Dino Jaws' is at the Natural History Museum, June 30-April 15 2007. See listings for details.

peterwatts@timeout.com

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224/236 Walworth Road, London SE17 1JE
Tel: 020-7708 2113 Fax: 020-7701 4489
e-mail: IPCB2000@aol.com

LONDON EVENING STANDARD (SERIES)

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20 APR 2006

Stomach-churning: the museum's model of the coelophysis which ate its young. Visitors will also see a fossil display of its stomach contents — and safety notices will warn them that some of the exhibits may be disturbing

It's our very own Jurassic Park

Hi-tech robotic dinosaurs arriving at the Natural History Museum

BY MARK PRIGG
Science Correspondent

323

THE most advanced robotic dinosaurs ever made are to arrive in London tomorrow as part of a blockbuster exhibition at the Natural History Museum.

It will feature seven life-size animatronic dinosaurs, built in Japan. Compressed air "muscles" will allow the models to move realistically.

Spokeswoman Emma Freeman said: "As far as we know, nobody else has ever created dinosaurs this lifelike."

A new exhibition space in the museum is designed to mimic the natural prehistoric environment.

The exhibition will include a pack of velociraptors devouring the carcass of a baby protoceratops, complete with grasping hands, climbing claws and teeth for ripping flesh.

The museum has been forced to include safety notices because of the disturbing nature of some of the exhibits, particularly of the deadly coelophysis, renowned for eating its own young.

"We have a fossil of the animal with one of its own young in its stomach, so we thought we should warn people," Ms Freeman said.

"But all of the models are very lifelike and that means there is a bit of blood and gore."

Visitors will also encounter the plant-eating iguanodon as it grasps at food with its flexible fifth finger.

A display called Dino Jaws will be home to three dramatic life-sized animatronic dinosaur heads.

These moving models of tyrannosaurus, brachiosaurus and edmontosaurus show the basic anatomical differences between meat-eaters and plant-eaters.

One side of each head is bare bones to show how the teeth and jaws moved together to tear, slash, grind and chew their food.

And while the rest of the world has tyrannosaurus rex and velociraptors — famously seen in Hollywood blockbuster Jurassic Park — the museum is to respond with the world's most advanced robotic dinosaur — "Barry" the fishing dinosaur from Dorking. Baryonyx, at nearly nine yards long and with a frightening 96 serrated teeth in his crocodile-like snout, will be the most advanced robotic dinosaur ever.

He is complete with a giant foot-long killer claw that was used for hunting and fishing 125 million years ago when Barry roamed the lakes and deltas of the southern Home Counties.

Tomorrow, the robotic Barry will take his first steps on British soil to prepare for the June opening of the exhibition.

Over the next month, museum engineers will build a small river area where he will hunt.

A recreation of the dig where his trademark claw was found will also be built.

It was discovered in pits south of Dorking in 1983 by amateur fossil hunter William Walker.

He passed it to the museum, where Alan Charig and Angela Milner named the species after Mr Walker, Baryonyx walkeri.

Ms Freeman said: "We're really pleased that the Baryonyx is the centre of this exhibition, as it really is London's dinosaur. We refer to him as Barry now.

"We've tried to put him in his natural environment and have been working closely with the curators here who actually named him to ensure his movement and behaviour is as accurate as we can make it."

● *The exhibition opens on 30 June. Tickets go on sale tomorrow.*

▶ www.nhm.ac.uk

Jaw-dropping: a display of a velociraptor, complete with grasping claws, eating its prey

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Merchandise

Soft toys

Mugs

T. Rex model

Dinosaur model set

Dinosaur Wellington boots

Dino Dig *T. rex*

For further details on these merchandise items, please contact the Museum's Mail Order department:

Tel: +44 (0) 20 7942 5494
m.order@nhm.ac.uk

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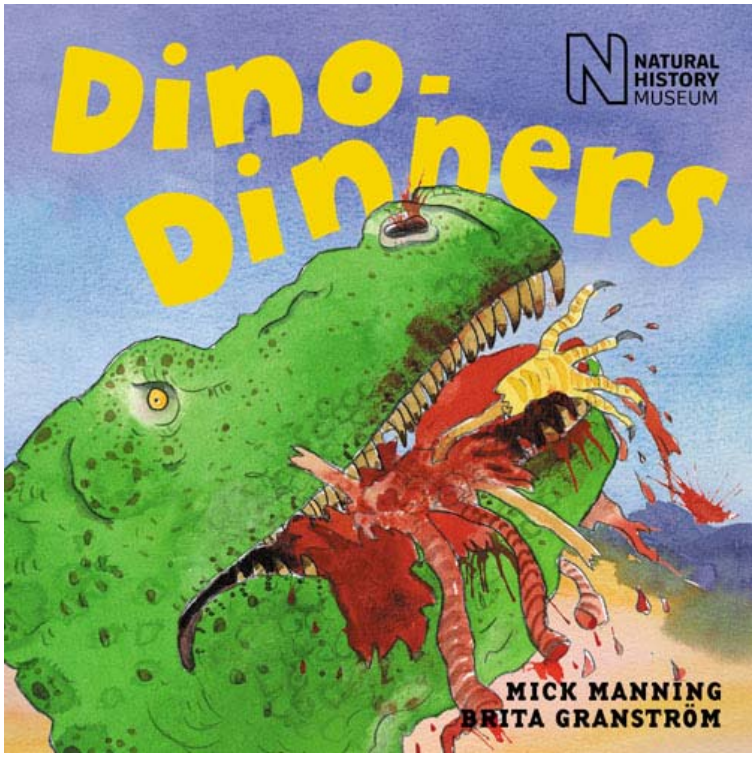
Book tie-in opportunities



It's dino-dinnertime, but who eats what, and who eats who? How do we know what dinosaurs ate? Who hunted as a team? Who ate with their head in the treetops, and who ate absolutely anything they could find? Discover exactly what is on the menu, as you are invited to attend this dinner party with a difference!

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Interest age: from three to six years

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Enquiries

For enquiries, please contact:

Maren Krumdieck

Marketing and Sales Manager

Touring Exhibitions

The Natural History Museum

Tel: 00 44 (0) 20 7942 6245

Fax: 00 44 (0) 20 7942 5686

m.krumdieck@nhm.ac.uk

Lizzy Cox

Head of Touring Exhibitions

L.Cox@nhm.ac.uk

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